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ABSTRACT

The purpose of this paper is to draw a distinction between the use of group work and subgroup work in the delivery of online courses, and along the way to pose the question "What should be the objective of the instructor?" To do this, four different models of online course delivery used in the teaching of information technology (IT) and information systems (IS) courses are described. Each model is distinguished from the others by the varying levels of group work (low to high) and subgroup work (low to high) used as an essential component of the learning process, and the advantages and disadvantages of each model are discussed. The paper concludes by suggesting that the objective of the instructor may play a hidden but substantive role in the selection of the model to be used. Includes one figure: level of group work/level of sub-group work. (Contains 17 references.) (Author)

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ONLINE COURSES AND COLLABORATIVE LEARNING: UNDERLYING PHILOSOPHIES AND PRACTICES

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ABSTRACT

The purpose of this article is to draw a distinction between the use of group work and subgroup work in the delivery of online courses, and along the way to pose the question "What should be the objective of the instructor?" To do this, four different models of online course delivery used in the teaching of IT and IS courses are described. Each model is distinguished from the others by the varying levels of group work (low to high) and subgroup work (low to high) used as an essential component of the learning process, and the advantages and disadvantages of each model are discussed. The paper concludes by suggesting that the objective of the instructor may play a hidden but substantive role in the selection of the model to be used.

INTRODUCTION

An appropriate definition of collaborative learning that will suffice for our purposes is "...a learning process that emphasizes group or cooperative efforts among faculty and students. It stresses active participation and interaction on the part of both students and instructors. [Bruffee 1984], quoted by [Hiltz 1994].

Collaborative learning is hardly a new topic. The importance and relevance of social interaction to an effective learning process has been stressed by many theorists from [Vygotsky 1978], through advocates of situated learning such as [Lave and Wenger 1991], and has been confirmed by many more recent researchers and practitioners.

An up-to-date review of the research and the long history of peer/collaborative learning can be found in [McKeachie 1999]. A small but select annotated bibliography on collaborative learning can be found at [Planck et al 1999]. An excellent list of strategies and tips for those interested in introducing collaborative learning can be found in [Davis 1993].

When students and instructors are linked by computers, the groups become electronic collaborative learning groups (ECLGs). Several studies appear to show that,

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particularly for more mature students, such a learning environment can be more effective than traditional face-to-face classroom sessions. See for example [Hiltz 1994, Harasim 1995].

Other benefits of group work, or collaborative learning, have been widely described in the literature. For example, group work is seen to enhance critical thinking [Gokhale 1995], and can assist in the retention of minority students [Berry 1991].

The phrase "group work" is usually used within an academic context in cases where the students are broken up into small groups; however, it is also used in cases where all of the students in the class work as a group. It is useful to distinguish between the two. This paper uses the term "group work" to mean an activity where all of the students in a class can interact (and thereby assist each other), and "subgroup work" to mean an activity where interaction occurs only within small distinct groups (and thus subgroups could be perceived to be competing against each other). This, the differentiation between "group" and "sub-group" is not at all a matter of the size of the group, but of whether the students perceive there to be competition between groups.

The phrase "online delivery" is used to refer to a course which is primarily web-based, with course materials and other items being made available over the Web to students connected from remote locations.

THE INSTRUCTOR'S OBJECTIVE

When the pedagogy to be used for the online delivery of a particular course is discussed, many topics are debated, but the objective of the instructor is rarely amongst them. For it is assumed, firstly, that the instructor is there to assist the students to learn, and secondly, that since this is so obviously the case, no further consideration of the matter is warranted.

In the academic context, all of the students share a common objective — to master the material sufficiently to ensure a good grade. In the "real world" outside of academia, it is generally the norm that people with a common objective will work together as a team, either formally or informally. Only where there is an element of competition — where the success of one might mean the failure of another — is this not usually the case.

Now, it may be argued that the students do not in fact share a common objective — rather, each student has the unique objective that he or she should get a good grade, rather than the whole class.

What then should be the instructor's objective? Suppose that the instructor has the choice of using two different methodologies, both of which tend to produce results in the form of bell curves with the peaks occurring in the Pass or Credit ranges; but that in one, the peak is very pronounced, with very few students achieving results in either the High Distinction or Fail ranges, whereas in the other the peak is less pronounced, with the final range of results being more widely spread. Suppose further that the difference is not a result of the marking scheme alone, but a true reflection of the students' learning. In such a case, which of the two methodologies should be preferred, and why? The current authors are not aware of any literature directly addressing this question; a paper discussing this issue in some depth is in preparation [Roberts, 2001].

It is at least arguable that faced with such a dilemma the instructor should strive for the good of the class as a whole, rather than for the good of particular individuals. This has obvious parallels in the realm of political philosophy, where — to take an admittedly simplistic generalisation — the theoretical Socialist will work for the good of the population as a whole, in the belief that this is most likely to benefit the majority of individuals, whereas the theoretical Capitalist will work for the good of each individual, in the belief that this will benefit the population as a whole. In what follows, therefore, we will refer to the former as a type-S choice, and the latter as a type-C choice.

This paper looks at four models of collaborative learning that fall on either side of this political divide.

THE FOUR MODELS

The four approaches, all in current use in the delivery of online Information Systems courses at Central Queensland University, are characterized in Figure 1.

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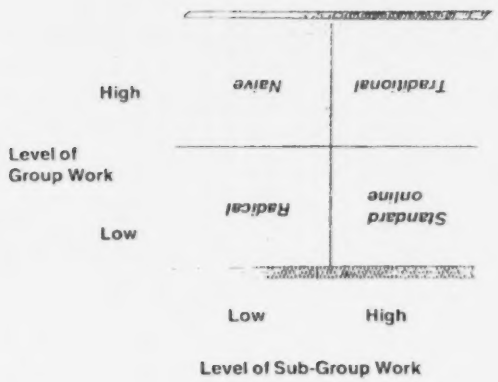
FIGURE 1



The traditional model is characterized by little or no use of subgroup or group work in the delivery of the content or the assessment of students. The radical model uses both subgroup and group work to almost the maximum possible extent. Sitting between these two, are the naïve model, which uses subgroup work but no group work, and the standard online model, which uses group work but no subgroup work.

The Traditional Model

The traditional model is used in probably 95% of classes where face-to-face teaching in the form of lectures and tutorials is the norm. This model therefore tends to be replicated almost by default when those same courses are delivered online. Group work is minimal, and students are expected to learn in a "sage on the stage -type scenario. Indeed, the translation to online delivery often results in less collaborative learning, since the ad-hoc informal groups that may have been used in tutorial sessions are now dispensed with; consequently, little or no learning takes place in a group setting. Individual students receive feedback and criticism primarily from the instructor(s). In some cases this is wholly in the form of returned items of assignment; in others, a varying amount of feedback may be given via email or other means.

There is therefore little or no opportunity for students to learn from each other, and the learning process is heavily reliant on the knowledge and teaching skills of the instructor.

Interestingly, even where the traditional method is used, students have a tendency to form their own informal study subgroups. This appears to be a more common practice in some cultures than others, being particularly predominant amongst students from countries in the Southeast Asian region, such as Singapore and Hong Kong. Often it can happen that members of such "unsanctioned subgroups end up being penalized because of the similarity of their assignment submissions. Thus, the traditional model can in fact be antagonistic to the idea of collaborative learning.

The traditional model can therefore be categorised as a type-C choice; whereas this may be as the direct result of a conscious decision by the instructor, it is at least equally as likely to be the result of a default to the currently-predominant paradigm.

The Naïve Model

The naïve model involves the use of sub-groups, but not the group as a whole. The most common form of the naïve approach is for students to be placed into small subgroups perhaps three or four students per subgroup for the purpose of working on and submitting one or more items for assessment.

Thus, the instructor can be claiming to be using group work, but again in an ad-hoc fashion. Often, the method is used primarily for reasons of expediency in a class of 100 students, for example, having to mark 25 assignment submissions is often seen to be a far preferable and less daunting task than marking 100. On the positive side, using subgroup work such as this may allow the assessment task(s) to be of a more realistic complexity than could otherwise be the case.

The naïve model allows the students to claim at subsequent employment interviews that they do indeed have experience of working in groups. And it is true that some students may have gained educationally from the experience of working in such groups. However, the lack of defined guidelines as to how the groups are to operate, and their use in the context of a single assignment submission, means that in many cases the work will have been carried out primarily by the more able student(s) in the group, and little real benefit will have been obtained.

The naïve model can be enhanced so that group work becomes an integral and more important component of the course. To do this, consideration needs to be given

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to the composition of the groups, the rules under which they operate, the methods to be used for assessing individual contributions, and other similar factors; see, for example, [Davis 1993, Emerson 1997, Gregory 1994, Wolf 1994].

In most cases the naïve model can also be categorised as a type-C choice; however, if more enhancements are added to increase the value of the subgroup work, the categorisation becomes less clear.

The Standard Online Model

The standard online model uses group work (but not subgroup work) almost as an accidental by-product of the technology. The inclusion of online discussion groups allows individual students to pose questions and receive feedback from all other members of the group. In this way, students are enabled to learn as much from each other as they do from the instructor. This is one of the most commonly quoted advantages of online distance education: see for example [Jones 1996a, 1996b].

Apart from online discussion lists, other forms of interaction from the group as a whole are possible. For example, provision may be made for anonymous feedback to be provided throughout the semester, thus allowing individual students to express comments without fear of retribution, and allowing the instructor(s) to glean valuable information by which to improve future offerings. Such a feedback mechanism has been described by [Svensson 1999].

The standard online model can be combined with the naïve model, so that subgroups are used for particular items, but questions can be posed by, and feedback can be gained from, all members of the group. In such cases the resulting model would be located close to the centre of the diagram in Figure 1.

Despite the opportunities for whole class interaction, in practice the standard online model remains a type-C choice, with little or no formal collaborative subgroups being used, and little or no group assessment work.

The Radical Model

Whereas both the naïve model and the standard online model use subgroup and group work to a certain extent, the radical model uses both subgroup work and group work to almost their fullest extent, both as a means of learning and as a means of assessment.

In the radical model lectures are dispensed with entirely. Instead, students are formed into subgroups, and learn by interacting amongst themselves, and using the vast amount of existing Web-based resources, with the academic staff member(s) providing guidance as and when required. A detailed description of the radical model can be found in [Romm & Taylor 2000].

Distinguishing features of the radical model include:

- a video sent out to all students prior to the commencement of semester explaining "the way the course works ;
- minimal traditional instruction from the academic staff; instead, students are expected to use the set text, and make extensive use of search engines and other facilities to seek out resources available on the Web;
- compulsory use of the course mailing list for communication;
- online electronic presentations prepared by the students themselves, each based on the topic for that week;
- the allocation of students into subgroups, each of which is responsible not only for providing an electronic presentation at some point during the semester, but also for responding critically to all other such presentations.

The online student subgroup presentations are expected to highlight the main points of that week's topic, to explain and, where necessary, defend these points, and to suggest issues for further thought that will engage the rest of the students in a critical analysis and discussion of the presentation. A one page summary, which can be in the form of a formal abstract, precedes the presentation, followed by a well-argued analysis/critique extending over two further pages (screens). Students are welcome to use additional sources and links as required.

Students are assessed not just for their subgroup presentation but also for their comments about other presentations. Each subgroup presentation is also assessed on the quality of the discussion that follows; for this reason, it is important to the students that their

electronic presentations are well crafted, thought provoking, and intriguing. Typically, by the end of semester, students will have received over one hundred inputs on their work from other students in their subgroup, other subgroups, and the lecturer.

Different assessment criteria may be used for example, for the electronic presentation, clarity and structure of presentation, originality of ideas, and ability to substantiate arguments by relevant data; for other contributions, understanding the arguments that are made by other presenters, linking them to the relevant literature, and making pertinent critical comments about these arguments.

In the last week of term, students are invited to submit a recommendation in writing on the performance of other students within their subgroup. The lecturer considers the subgroup's recommendations when allocating individual marks to members of that subgroup. A student that a subgroup decides did not contribute sufficiently may as a result suffer a reduction in mark.

The students' final marks are based on a combination of their subgroup work throughout the semester, and their performance in a closed-book end-of-semester examination.

Amongst many real advantages of the radical model may be listed the emphasis on subgroup-work, the need to use real-world skills both for effective communication and research, and the significantly lower demands on staff time than with most other models. However, students need to adapt early to the demands of the model (the first presentations are made as early as week three or four of the semester), and the model is perhaps more appropriate for postgraduate and later-year undergraduate students rather than recent school-leavers.

The radical model is the only one of the four models described here which falls clearly within a type-S categorisation. However, although this is undoubtedly true within the learning context, the assessment can be skewed toward either type-C or type-S categorisation depending upon the weight afforded to the final (individual) examination.

CONCLUSIONS

Four different models of online course delivery have been described which vary according to the extent to which two forms of collaborative learning, group work and subgroup work, are employed as both learning and assessment tools.

The radical model uses both group work and subgroup work to a significant extent. However, even in cases where the radical model is employed, it is usual to have an individual end-of-semester examination as a significant component of assessment.

It is instructive to conclude by returning to the question raised at the beginning, the objective of the instructor. In the traditional model, each student is expected to learn largely on their own; this is likely to be hardest for the least able students, and easiest for the most able. The traditional method therefore can be expected to produce a significantly wide range of results. Therefore, if the instructor is of the view that a wide range of results is preferable to a narrow range, the traditional model is likely to be favoured.

As a greater amount of collaborative learning is included, as with the naïve and standard online models, so are the least able students able to benefit more readily from the increased interaction with their peers. Thus, the range of results is narrowed slightly, while it seems probable that the mean has remained the same, or perhaps increased slightly. The naïve model is likely to be chosen by the instructor not because of this, but more likely because of the belief that it is beneficial to expose the students to some form of collaborative learning.

The standard online model is most likely to be selected primarily because of the capabilities of the existing technology, rather than for any theoretical pedagogical reasons.

When the extent of group work and subgroup work is increased to a very high level, as with the radical model, it is to be expected that the range of results will tend to diminish, while the overall pass rate will tend to increase. This model (or something like it) is likely to be chosen by instructors seeking the maximum amount of interaction amongst their students, and is the only one of the four models to fall clearly within a type-S categorisation.

Thus, it can be seen that in practice the choice of the model to be used for a particular course is not only dependent upon strictly pedagogical issues. It is likely also to be determined to a significant extent by the prior attitude of the instructor toward collaborative learning, and in particular whether he or she believes that a wide

range or a narrow range of results is preferable. Thus, in the mind of the instructor, the type-C or type-S distinction plays an important (but often unconscious) role.

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